3-92

Zero Beat

March 1992

Hampden County Radio Association, Inc

Springfield, Mass

Our 45th ARRL Affiliated year

Next Meeting:

Friday March 6, 1992

George Hughes W1ALL

speaking on Military Affiliated Radio Stations MARS

Feeding Hills Congregational Church
Feeding Hills, Mass
Doors open at 7:30 PM, Meeting starts at 8

KC1ZJ's Technical Corner will feature Al Carpin, NA1W, noted author, explaining transverters

FLEA MARKET

MOUNT TOM AMATEUR RADIO ASSOCIATION

SUNDAY MARCH 1ST
Smith Vocational High School
US Rte 9
Northampton, MA
Doors open for general admission 9 am
Sellers only at 8 am
VE session at 10 am

Tables : In advance $12.00
At the door: $15.00

General admission: $3.00

For more information:
N1CDR Mickey Yale 562-1027

FLEA MARKET

HAMPDEN COUNTY RADIO ASSOCIATION
SUNDAY APRIL 26
Southwick Recreational Center
Southwick MAss
Doors open for general admission at 9 am
Sellers only at 7 am
Exam registration 9-9:30 am
Exam space is limited, first come, first served
VE sessions start at 10 am

Tables: in Advance: $7.00
At the door, if available: $10.00

General admission: $2.00

For more information :
KA1TBS Fred Gore 569-3579
K1II Charlie Dunlap 569-5988

In This Issue:

Articles and ads for Zero Beat should be sent to:
Jeffrey J. Duquette, K1BE
18 Anvil Street
Feeding Hills, MA 01030-1530

Upcoming Events:
Club Flea Market
Field Day '92
June VHF Contest

Club Activity Night

By

Fred Stefanick N1DPM

The past January VHF Sweepstakes really showed there is a sizable interest in the UHF and microwave bands. For example, on 70cm band (432/446), I worked a total of 112 QSO's. Out of those 112, 46 were FN32, and 26 were FN31! That's 72 QSO's or 64 percent. On 903, out of 24 contacts, 11 were FN31 or 32, or 46 percent. On 1296, out of 35 contacts, 24 were either FN31 or 32, or 69 percent. On 2304, out of 12 contacts, only 3 were not HCRA members. Obviously there is a lot of local interest in these bands. People always say "There's never anybody there". First of all congratulations are in order to all who did operate on these bands. Your efforts helped the club aggregate score out tremendously. For instance W1NY worked 12 QSO's and 5 grids on 2304; without this band, the W1NY winning score would have been 21, 356 points less! So, how do we get regular activity on these upper bands?

LET'S HAVE A CLUB ACTIVITY NIGHT!

I'd like to pick one night per week as "activity night". My original idea was to start at 432/446 and work our way up until we ran out of people or frequencies. We could start about 8 pm and work up to finish about 10 pm. I'm looking for your input as to which night. Send me a postcard, talk to me at the next meeting, call on the radio (449.175), or on the phone, 786-7943. If you think we should start on a lower frequency, (6 or 2 meters), let me know. You'll be able to see how your new antenna works, make amplifier adjustments, check out the new mike, new radio, or see if the no tune transverter you just built works. (I hope, I hope!)

This would provide a regular active group on these uncrowded bands. Maybe these could be informal nets? Let me know. I present a complete profile in the next issue of Zero Beat, and we'll give it a whirl!

Mount Greylock DXpedition

By

Fred Gore KA1TBS

Back in July, Bob KA1QFE and I had the notion of roving during the January Sweepstakes. The noise level provided by our friendly utility company was one factor in not staying home. They have made progress though, the noise was 9+20 and is now 9.

Bob and I did not tell anyone our real plans, even though you heard us driving around and testing various sites. January 17th arrived and we were ready. Bob secured permission to operate on top of Mount Greylock. We were required to trek with us 200 pounds of sand, use a four wheel drive vehicle, 4 tire chains, cellular phone, front and rear truck winches, (Editor's note....Fred wrote that he had to take a wench with him, but I think it was a spelling mistake. She was no where to be seen during the video) food for several days, plus radio gear. We also took along aircraft radios, but had no need to use them.

We picked up the keys at 11 am, and were told there was no snow on the top, and very little on the road, but a lot of ice. We put four tire chains on to haul our load to the top. This included: car hauler, generator, winch-controlled 25 foot Rohn tilt up tower, 7 antennas,-1 aircraft, 32 element Rutland 432, 8 element Rutland 2 meter, 440 Coy, 220 Coy, 2 meter Coy, 1296 Down East Looper. All antennas were fed with either 1/2 inch hardline or 7/8 inch hardline, except the aircraft.From the ground to the 1296 antenna was 51 feet! It took about one hour to set up. Bob's expertise in scavaging parts was great, the base and the frame of our tower is from a helicopter.

Atop Mount Greylock the high temperature was 12 degrees Faranheit and winds of 30 mph., which put the wind chill at minus 28. A reading at 4:30 pm indicated zero degrees and 40 mph winds, or minus 54F wind chill! By 7:30 it had dropped to minus 67 F.

The food was excellent, once we got the propane to light at these low temps.Bob's a super cook. We had problems with 1296, which were our own fault. We managed to work KA1ZE, but it was at nano power levels. Most of the problems were New York, Boston, etc. killing us. As night fell, we broke everything down and called it a day. On the air time was about 6 hours. Coming down the ice covered road was really something. We'd decided that if things got out of control we'd open the doors, jump, and pull the rip cord!

We stayed the night at the Cummington Radar site, and had a great breakfast cooked up by Chef Bob. Then off to FN31 at East Hartland, Connecticut, for another few hours on the air. Our score, if I didn't mess up the logs was 12,924 points. You don't need power when you've got height, that's proven for sure!

Editor's note.....If you missed seeing the video at the February club meeting, it is well worth your while to watch. You'll never sign up for one of Fred and Bob's death defying trips after seeing the descent off the mountain!

Silent Key

It is with great regret we notify you that
Dick Goodman, WB1HIH has died.
Dick was the spark driving the
Northern Berkshire ARA for many, many years.
He'll be missed by all his amateur radio friends.

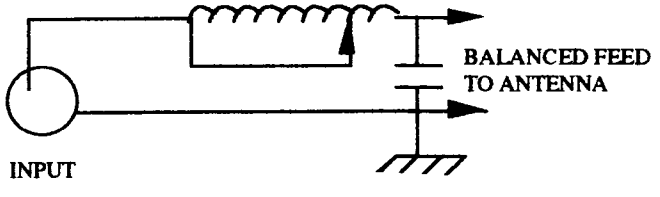
Junkbox Antenna Tuners

By

Art Zavarella W1KK

I called up Paul Kress, WA1ZKT, to commend him on his nice balun construction article in the December 1991, Zero Beat under the title of "antenna Antics". I asked if he would mind if I related some of my experiences that might be considered to fall in the area of enhancing antenna performance via junk box rather than using shrinking dollars. As expected, Paul enthusiastically invited me to join the junkies of antenna antics!

At first, I wish to concur fully in Paul's statement on the virtues of TV twinlead for feeding ham antennas, for both HF and VHF. I definitely is readily available and cost effective balanced line. However, my recent experience shows that it works quite well without the need for a balanced tuner, or balun; such as with a simple "L" tuner. This device is anything but balanced, and consists of one variable capacitor and one inductor. This versatile L network was treated in some detail by Measures, AG6K in his classic balanced balanced tuner in the February 1990 QST. The version I use is the Z step up/ step down, low pass depicted as (A) in his Figure 1. My implementation of this circuit is below with the variable capacitor stator connected to the antenna side of the inductor to which one side of the balanced feeder is slipped. The other side of the feedline clips to the common ground with the capacitor rotor, and braid from the coax connecting the SWR meter. The inner conductor of coax from the SWR goes to the low Z (input) end of the coil where the shorting flexible wire goes. The other end has a suitable clip for shorting out as many turns as necessary to provide the requisite ratio of L to C in the hot end of the L. The schematic is accordingly not only upside down, but also right side left.



My first on the air use of the L was in preparation for the ARRL contest. My HF all band antenna is a 650 foot horizontal loop averaging a height of 50 feet supported at five points with white plastic clothesline pulleys zig-zagging all around the back of the QTH. A 50 foot length of 600 ohm line connect the antenna at the nearest tower at the back of the radio shack. I wanted to use the KW amp on hand in the top band fray coming up in a week or so. MY KW Murch tuner covers only through 80 meters. So back to the junk boxes. The coils box had a nice big edge wound ribbon inductor on its own base, with 46 turns, 4.5 inch OD by 8.5 inch long with plenty of space between turns to permit using a husky Mueller 20 amp clip to shorting out unneeded turns. The big "condensers" box yielded a nice oldie Cardwell variable stamped XE-400-XS with good KW spacing. Both units are mounted on a piece of 3/4 in board 8 in x 16 in long. With this junk box L tuner, plus the 650 foot horizontal loop antenna I entered the ARRL International 160 meter contest, and was awarded first place, single op, high power for club station W1NY in Western Mass!

73, W1KK

VHF SWEEPSTAKES SCORES

TOTAL POINTS AWARDED	CALLSIGN	91 JAN SS	MULTIOP POINTS
12222	K1BE	10164	2058
9198	N1JJD	4116	5082
3060	N1EJG	3060	
99	W1VNE	99	
465	WA1SMH	465	
1120	W1ETH	1120	
18352	NA1W	18352	
1776	K1JAO	1776	
204	W1MM	204	
86760	N1DPM	86760	
2227	K1WVX	2227	
4128	K1CYD	4128	
14	N1JJO	14	
370	N1EPE	370	
10556	W1ZGP	10556	
84	NJ1E	84	
354	N1GVV	354	
296	AC1T	296	
396	W1ALL	396	
412	N1JOH	412	
30	KA1EXJ	30	
185	N1FFZ	185	
84	N1IED	84	
366	N1EVE	366	
8496	K1II	8496	
2400	WA3EEC	2400	
224	KA1CRX	224	
13505	K1CPJ	13505	
408	W1UWX	408	
1050	N1AEH	1050	
10675	KA1WER	10675	
5340	KC1ZJ	2	5338
12924	KA1TBS	12924	
6312	KA1QFE	6312	
2604	KC1TV	2604	
41902	WZ1V	41902	
3210	N1ABJ	3210	
4020	N1DOP	4020	
106	KB1AZ	106	
83174	W1RIL	83174	
126	WB1GLZ	126	
4640	KA1VED	4640	
2400	KA1VEC	2400	
8460	NM1K	7200	1260
4660	W1AW	4660	
268	KA1QHG	268	

Protection From Out of Band Signals

(What you don't see can impair your receiver performance!)

By

John Balboni AC1T

I originally set out to write this article about filters which could be used to prevent crossband interference when trying to simultaneously operate two VHF bands from the same location. It became apparent that a culprit exists in today's RF polluted environment which can unknowingly degrade receiver performance of even some of the most expensive VHF and UHF amateur radio equipment. Measures which the typical amateur takes to improve his receiver's sensitivity and lower its noise figure can further degrade performance!

What is the culprit, you may ask? High power commercial FM radio and TV transmitters. The scope of this problem cannot be fully appreciated until you realize that the effective radiated power (ERP) of many FM broadcast stations is 50,000 watts. TV broadcast stations can have ERP's as high as several megawatts! And the power is usually radiated in both horizontal and vertical planes.

This experience serves as a backup. Fred Stefanick, N1DPM, who lives two miles line of sight from Provin Mountain recently put up an H frame of four 12 element N1DPM Yagis (*See the October 1986 issue of Zero Beat for more information) for 2 meter SSB. The antennas seemed to be working correctly, however, he wasn't hearing things as well as he expected. Fred uses a tower mounted GASFET preamp, (*See April 1987 Zero Beat for his article, "Tower Mounted Preamps") for reduced noise figure, and a Drake SC-2 receiving converter, with J-FET front end on 2 meters.

FM radio station WAQY at 50kw ERP is located on Provin Mountain. Fred became suspicious that this signal at 102.1 Mhz might be desensing his receiver. Both a CATV field strength meter, and a spectrum analyzer were used to measure the level of signals coming down the 2 meter feedline after the preamp. The signal strength of WAQY was measured at -15 dbm (decibels referenced to 1 milliwatt power level), which is 40,000 microvolts!

The type of GASFET which Fred is using, the ARR P144 VDG, goes into gain compression at +10 dbm (700,000 microvolts) of input signal. Since the signal coming out of the preamp was considerably less than the input compression point, it was assumed that the preamp was NOT in gain compression. This is important to know, as it determines where in the system to insert filtering to remove the WAQY signal.

If the preamp was determined to be in gain compression, then any type of filtering used to remove WAQY would have to go ahead of the preamp, and be mounted up at the antenna, where the preamp is located. Since the preamp was not in gain compression, the filter could be installed anywhere after the preamp output. The best place for this is in the shack, where the temperature is stable, and the filter can be easily protected from the elements.

In the case of Fred's installation, we decided to try using a simple quarter wave stub, cut to 102.1 Mhz. A calculation was made, based on the velocity factor of the 75 ohm RG11 coax used, (actually, the stub was made from an old Cushcraft supplied 2 meter balun - they were cut to the wrong length for the antenna - rather than throw it away). The stub, left slightly longer than what was calculated for length, was connected to the 2 meter receive feedline from the tower mounted preamp using a T connector.

The spectrum analyzer was connected to the T connector for tune up. The stub was trimmed for maximum attenuation of the 102.1 Mhz signal with better than 30 db of attenuation resulting. As an added measure, a second stub was cut for WMAS at 94.7 Mhz. It was separated from the first stub by roughly a half wavelength of coax (1/2 wave at 144 Mhz). This second stub further reduced the WAQY signal by an additional 10 db, while reducing WMAS by 30 db. Overall, both stubs reduced all FM broadcast signals by 20 to 50 db, depending on frequency.

Final verification that all this work did any good was needed. The conglomeration of quarter wave stubs and T connectors were connected to the 2 meter input of the Drake receive converter. A weak signal was tuned in at 144.2 Mhz. While observing the signal, the stubs were connected and disconnected from the receive line to the converter. Signal strength increased by 6 db when the stubs were in place, and the background noise level also dropped! This was particularly evident when the 2 meter antennas were aimed North west looking right at Provin Mountain. The stubs made all the difference between hearing and not hearing weak VE2, VE3, Western New York, and Ohio stations!

On summary, strong out of band signals from commercial broadcast stations can cause desense to occur in amateur VHF and UHF receivers. The desense usually goes unnoticed, as the commercial stations may operate 24 hours per day, or when they do go off the air it is late at night when there are few amateur signals on for comparisons. Each receiver or receive converter will handle strong signals differently, depending upon such factors as front end selectivity, front end dynamic range, mixer spurious responses, and mixer overload. All of this is complicated by adding a high gain, broadband preamp ahead of the receiver front end. One has to know what the preamp is doing too. It takes very careful system design to pull 0.1 microvolt signals out of the noise when you have a 40,000 microvolt signal only 40 Mhz

away!

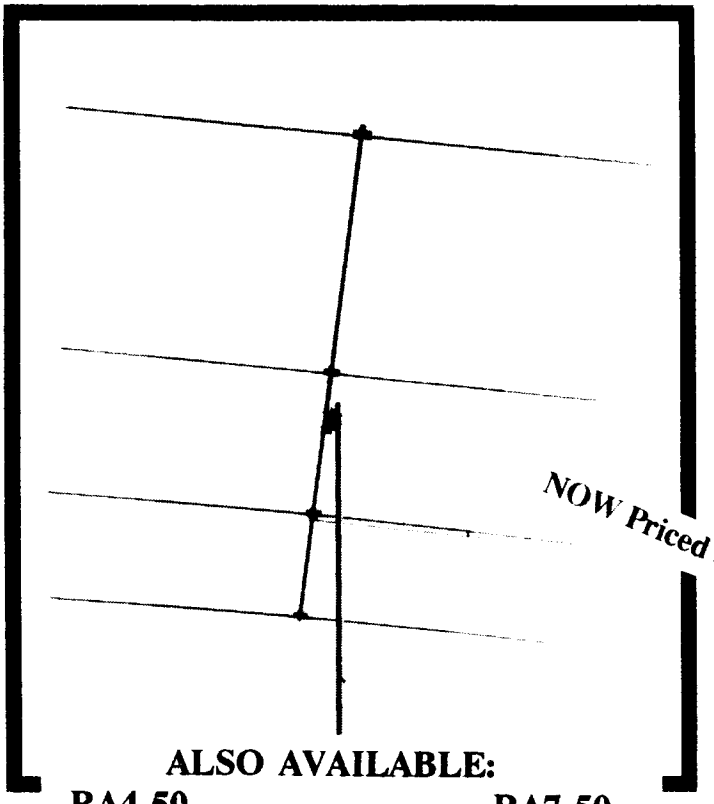
Desense from out of band signals may not be an easy problem to solve. It requires a large amount of patience, which is helped by having test equipment available to make the necessary measurements. If you think the manufacturer has published all of the information about his equipment to solve this problem, guess again! Most manufacturers of amateur equipment design for high in band sensitivity and receiver performance. Knowledge about what happens due to strong out of band signals is rare. In other articles I will try to present information on both commercially purchased and homebrew filters, which can be used to reject undesired signals, as well ass more specific data on preamps.

*Will be reprinted in the future

Swiech Communication Systems

RUTLAND ARRAYS

Model: RA4-50



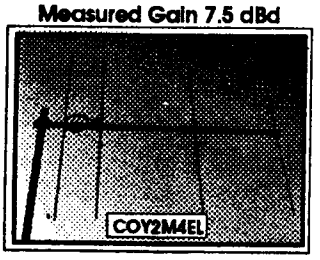
NOW Priced at $139.95!!

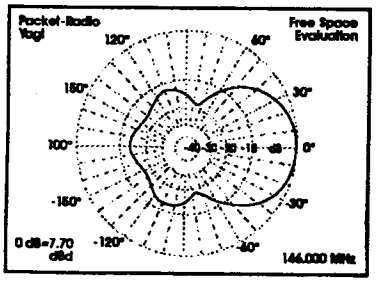
ALSO AVAILABLE:

RA4-50		RA7-50
RA8-2UWB	FO22-432	FO25-432
FO12-144	FO22-ATV	F033-432
FO15-144	FO16-222	FO11-440
Power Dividers	Stacking Frames	

Two Meter Yagi Great For Packet Radio or FM

Measured Gain 7.5 dBd

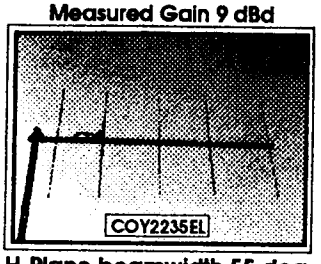


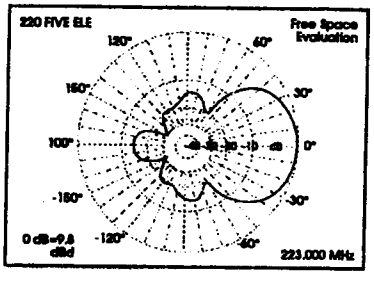


H-Plane beamwidth 60 deg
Bandwidth 144.5-147.5 MHz
SWR < 1.7 at Band Edge
Impedance 50 ohm
Silver Plated Teflon SO-239
Maximum Power 500 Watts
Chemfilm Treatment On Brackets
Balanced Matching System
Two Part RTV Potting
Black Delrin Insulators

223 MHz Yagi Optimized Design

Measured Gain 9 dBd





H-Plane beamwidth 55 deg
Bandwidth 220-224 MHz
SWR < 1.7 at Band Edge
Impedance 50 ohm
Silver Plated Teflon SO-239
Maximum Power 500 Watts
Chemfilm Treatment On Brackets
Balanced Matching System
Two Part RTV Potting
Black Delrin Insulators

RUTLAND and COY Antennas
Available from:

Fred Gore KA1TBS
40 Birchwood Road
Southwick, MA 01077

413-569-3579

Master Card/ Visa accepted

See Fred at the Flea Markets
Mar 1 & April 26th

How I Got Started
By
Larry Reilly W1BVP

Only a few days ago Jeff Duquette, K1BE paid me a visit. We became acquainted thanks to our mutual friend, Jim Spates, W1ARA. Jeff took for distribution some old gear I had lying around for the past fifty years. I hope some youngster just starting out can use it. Jeff left with some back issues of Zero Beat-- the most memorable of all was the issue tracing the history of the Hampden County Radio Association. I found it fascinating and was reminded of the verse from the Rubaiyat of Omar Khayyam (stanza 69):

The Moving Finger writes; and, having writ,
Moves on: nor all your Piety nor Wit
Shall lure it back to cancel half a line,
Nor all your Tears wash out a Word of it.

Our get-acquainted visit covered several topics and I'm not sure how, but I volunteered to tell Zero Beat how a "ham" got started over fifty years ago! So, here we go.

I'm sure you want to know if amateur radio had an influence on my life. The answer has to be "LOTS!". Accompanying this article is a copy of my first license, issued when I was 17 years old. A year or so before that license was issued, another teenager and I tried to teach each other the Continental Code. We hooked up a pair of homemade keys to a buzzer we both could hear, using ARRL's Radio Amateur Handbook for guidance. Not a bad guide, but we didn't get very far, for neither of us knew a dit from a dah! Sort of the blind leading the blind!

Then came a newspaper article calling my attention to the Springfield Radio Association. Recruits were welcome, and I became one immediately. Meetings were held every Saturday evening in a small building, (about the size of a one car garage) located behind Ike Creaser's home on Cortland street. This was less than a mile from my parent's home.

Joining the SRA shaped my life. The members, (all much older than I), were experienced hams and very helpful to a headstrong lad not yet ready to shave. But topping them all was the man who meant the most to me: Isaiah "Ike" Creaser. After our first meeting I spent as much time as possible at the "shack". At that time you either walked or took the family car--No choice for me, we didn't have one.

Ike was a great teacher. In a few weeks (he worked in Stamford, and was home only on weekends,) he got me up to ten words-per-minute so I could pass the exam. Three years later I won an award at a Boston hamfest for copying 60 W.P.M.! I was then newly married. When my future wife and I got engaged, I didn't have enough money to buy her a diamond. Instead I gave her a medal I had won in an ARRL Sweepstakes Contest! She later got her diamond and wedding band, but that medal is still in her collection of keepsakes.

When Mrs. Reilly heard me banging out these memoirs at the typewriter, she asked if I remember the time (before our marriage) I asked her to hold a spool of wire while I wound a coil for something I was building. Memories, memories!

With Ike Creaser's recommendation, I landed a job at WBZ(A) as an apprentice radio operator and that led to a life long career in radio. My ham call was W1BVP. Then the Pearl Harbor disaster ended it all! As directed by our government, I dismantled all my gear, including a new rig I was building, and I never put it back together again. I was into radio broadcasting, building stations, and let my ham call lapse. Not sure I could copy 10 WPM, let alone 60 today! After my hams days ended, I was building commercial stations in Connecticut, New York, and Massachusetts, both AM and FM.

Nearly all, if not all, of those Depression era members of the SRA are gone now. Today I find it hard to remember their names or call letters. Just the same, they were a good influence on a growing up kid. They gave me something unpurchasable: a grip on myself. I am grateful for the career that ham radio led me to, even if my fiance had to help me wind coils before I could buy a diamond ring for her!

Now we're retired. My boating days are also just memories. Mrs. Reilly and I used to cruise our boat, PRIME TIME, to and from Florida. All good things must come to an end. Resting on my desk is a semi-automatic sending key modeled after the Vibroflex, that I used in my ham days. At WBZA we were linked to WBZ in Boston by wire line. We got to use a genuine Vibroflex. I wanted one in the worst way for my ham station but my $78 dollar per month salary was otherwise committed. So I made as near a replica as I could contrive! Just a few days ago I fingered the paddles to see it it still works. It does, but I'm back at 10 WPM!

When I was a lad, it was ham radio. Now the grandchildren are into computers. What next?

73,
Larry Reilly -(W1BVP)

Note from K1BE:
This was originally printed on the letterhead of the Springfield Radio Association. If you're new to the Hampden County RA, this was the original club the HCRA is based from. The name was changed after World War II.

President's Corner
By
Bob LaFleur NQ1C

Just think, pretty soon the winter will be over... The days will be longer... And you'll be able to work on those antennas that didn't survive the winter. We didn't get much snow or ice to bother antennas, but we sure did get lots of wind. Or maybe I was just more conscious of it now that I have a tower? Anyway, it seemed awful windy this winter to me!

Yes, it's that time of year again. The board of directors is finalizing the last meeting details, getting ready for the fleamarket, banquet, and Field Day, and thinking about the election of next year's officers. Would you like to help run the club next year? Maybe a seat on the board is for you! If you'd like to run, Jim Sebolt N1DUY has some election ballot forms. Fill one of these out, and return it to Jim by the May meeting. We'll put your name on the ballot, and the club members will vote at the June banquet.

Last year we tried something different and had our June banquet at "The Wherehouse?" in Holyoke. The response was so great that we've decided to have our banquet there again this year. If you've never been to "The Wherehouse?" before, you're in for a treat. It is a very unique place with every imaginable artifact of this area's history on the floors, walls, ceilings, and other places, including an airplane nose sticking out the side of the building. We'll have more details on the menu and prices for the banquet at the upcoming meetings.

We're also going to do a repeat performance of last year's fleamarket in Southwick again this year. We're going to run things very similar to last year's fleamarket, so if you had a good time, you're likely to have a good time again! Listen for the announcements on locals nets for the latest details.

There's a lot going on in the next few months... So join the fun and enjoy ham radio!

FOR SALE: [Moving into a condo]
ANTENNAS ALL CUSHCRAFT
ARX2B ringo ranger 2 meters, $25
416TB 435 16 element twist yagi for satellites, $50
A50-3 2 element yagi for 6 meters, $40
A144-20T 2 meter 20 element yagi for satellites $60
215WB 2 meter 15 element SSB, CW $60
424B 432 24 element yagi SSB, CW $60
All of the above with instruction sheets, etc.

Butternut HF%-V 10, 15, 20, 40 meter vertical stub tuned radials $45
HyGain TH3JR 3 element yagi for 10, 15, 20 $135

Alliance HD 73 rotor $65
Alliance U110 rotor $25
Two radio Shack TV rotors new one, $45, used one, $30

Yaesu FT726R, immaculate, 2m, 432, 6m manual. $950 Firm!
Ned NB1R 596-4625

MICROWAVE TRANSVERTERS

SHF SYSTEMS No tune linear transverters and transverter kits for 902, 1269, 1296, 2304, 2400, 3456 MHz. All use 2m i.f.g13.8V. Kits include mixer and L.O. P.C. boards, xtal and all components. Built units include I.F./D.C. switchboard, connectors and compact low profile housing. Other frequency options in amateur band available.

SHF 900K	902-906 MHz	50mW	Kit $139	Built $265
SHF 1240K	1296-1300 MHz	10mW	Kit $149	Built $265
SHF 1269K	1268-1272 Oscar Mode L	10mW	Kit $140	Built $255
SHF 2304K	2304-2308 MHz	10mW	Kit $205	Built $325
SHF 2401K	2400 MHz Mode S rcv Conv		Kit $155	Built $255
SHF 3456K	3456-3460 MHz	10mW	Kit $205	Built $325
SHF LOK	540-580 MHz L.O.	50mW	Kit $ 66	

MICROWAVE AMPLIFIERS
from
DOWN EAST MICROWAVE

Linear Power Amps
for SSB, ATV, FM, 902—1296—2304—3456MHz

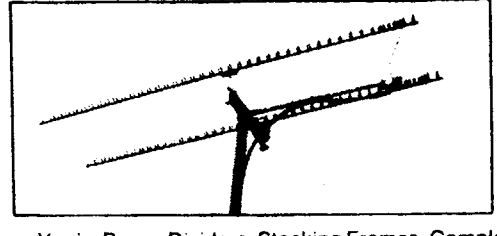
2304 PA	10mW in 5W out	1240-1300 MHz	$140
2318 PAM	0.5W in 18W out	1240-1300 MHz	$215
2335 PA	10W in 35W out	1240-1300 MHz	$325
2340 PA	1W in 35W out	1240-1300 MHz	$355
2370 PA	5W in 70W out	1240-1300 MHz	$695
3318 PA	1W in 20W out	902-928 MHz	$275
3335 PA	14W in 40W out	902-928 MHz	$335
1302 PA	10mW in 3.0W out	2304 MHz	$400
901 IPA	10mW in 1W out	3456 MHz	Write or Call

T/R Switching available, all 13.8 VDC

Low Noise Preamps & preamp kits—432, 902, 1296, 1691, 2304, 2401, 3456 MHz, 5.7 and 10 GHz.

33LNA	preamp .6 dB NF	902 MHz	13.8V	$ 95
23LNA	preamp .6 dB NF	1296 MHz	13.8V	$ 95
13LNA	preamp .7 dB NF	2300-2400 MHz	13.8V	$130
1691LNAWP	preamp 1 dB NF	1691 MHZ mast mounted	13.8V	$140
4017LNAK	preamp kit	400-1700 MHz	.6 dB	$ 40
Preamp kits for 2304-10 GHz				Write or Call

MICROWAVE ANTENNAS



Loop Yagis, Power Dividers, Stacking Frames, Complete Array of 902, 910, 1269, 1296, 1691, 2304, 2401, 3456 MHz. For Tropo, EME, Weak Signal, OSCAR, ATV, Repeaters, WEFAX, Commercial point to point. Available in kit form or assembled and tested.

3333LYK	33el	loop Yagi Kit	902 MHz	18.5 dBi	$ 95.00
2345LYK	45el	loop Yagi Kit	1296 MHz	21 dBi	$ 95.00
2445LYK	45el	loop Yagi Kit	1269 MHz	21 dBi	$ 95.00
1844LY	44el	loop Yagi (assem.)	1691 MHz	21 dBi	$105.00
2355LYK	55el	Superlooper Kit	1296 MHz	22 dBi	$108.00
1345 LYK	45el	loop Yagi Kit	2304 MHz	21 dBi	$ 79.00
945LYK	45el	loop Yagi Kit	3456 MHz	21 dBi	$ 79.00

Other models available. Call or write for catalog.

DOWN EAST MICROWAVE
Bill Olson, W3HQT
Box 2310, RR1 Troy, ME 04987
(207) 948-3741
FAX: (207) 948-5157

1991 CLUB OFFICERS 1992

President: NQ1C Bob Lafleur
Vice-president: N1EPE Larry Lemoine
Treasurer: N1AEH Greg Stoddard
Secretary: N1DUY Jim Sebolt

Directors:

K1CPJ Bob Cohen
KA1QAS Scott Cohen
K1II Charlie Dunlap
NC1I Frank Potts
WA1YCA Tryon Cote
WA1PLS Ed Goldberg
KA1TBS Fred Gore
N1DPM Fred Stefanik

Next B/D Meeting

Larry Lemoine's N1EPE
Thursday March 12

Membership renewals should be sent to the club mailing address. ($10/year)

Next Meeting

Friday March 6, 1992

Feeding Hills Congregational Church

George Hughes W1ALL
speaking on Military Affiliated Radio Stations

Hampden County Radio Association, Inc.
P O Box 482
West Springfield MA 01090-0482

SPRINGFIELD, MA 01
PM
27 FEB
1992

Wood Duck
29
USA

Forwarding & Address
Correction Requested

011 SPFLD MA **First Class**

AC1T E V C A 14 I 10/92

[redacted]